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*Douglas C. Deschenes  
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Of Counsel:  
Natasha Ramsingh\*  
\*Licensed in FL & MA*

December 4, 2009

Acton Planning Board  
Ryan Bettez, Chairman  
Acton Town Hall  
472 Main Street  
Acton, MA 01720

RE: Special Permit Application  
5-7 Craig Road, Acton, MA

Dear Chairman Bettez and Members of the Board:

Please be advised that this office represents SBA Towers II, LLC regarding a proposed wireless telecommunication facility to be located at 5-7 Craig Road in Acton, Massachusetts. The Applicant proposes to construct a 170' monopole tower, designed to accommodate a maximum number of technically feasible co-locators in conformance with Section 3.10.6.5 of the Acton Bylaws. The proposed monopole tower is necessary to service a Significant Gap in wireless coverage in the Town of Acton.

In conformance with the Town of Acton Bylaws Section 3.10, as well as the "Rules and Regulations for a Wireless Communication Facility Special Permit", enclosed please find an application for a wireless telecommunications facility.

Also enclosed in regards to the above referenced application please find the following:

- A) Special Permit Application form.
- B) A copy of the most recently recorded deeds for the lot in question.
- C) Certified Abutters List along with required certified envelopes and postage.
- D) Plan showing the location of the Wireless Communications Facility.
- E) Plans showing information requested in Section 3.7 of the "Rules and Regulations for a Wireless Communication Facility Special Permit."
- F) Water Balance Calculations, Drainage Calculations and Earth Removal Calculations.

- G) Affidavit from Radio Frequency Engineers stating that other sites were considered and that for technical and physical reasons, the proposed site is most ideal.
- H) Maps showing existing coverage along with a letter from the Radio Frequency Engineers regarding why it is necessary for the Tower to be placed in the proposed location.
- J) Copy of the FCC License for Clearwire Corporation.
- K) Copy of the FCC License for T-Mobile License LLC.
- L) Copy of results indicating no need to register with FAA in connection with the above application.
- M) Application Fee.

Please be advised that as part of this application we are requesting waivers of the following sections of the Acton Bylaw:

Section 3.10.6.4: The tower as proposed is a Monopole tower with external standard Antenna mounting frames. Given the industrial nature of the area, and for other practical and technical reasons, a CAM tower is not ideal.

The Applicant has located the proposed monopole tower in a manner which is designed to minimize the visual impact of the site. The tower is to be located in a Light Industrial Zone. Craig Road contains multiple existing industrial buildings that already provide screening to the site. In addition, No residential building is within 500' of the proposed Monopole Tower. The Applicant is also proposing to provide a landscape buffer around the proposed equipment shelters as described in more detail in the attached plans. It is the Applicant's belief that given the location of the proposed wireless telecommunication system, the need to provide coverage to a Significant Gap in the area, and because there will be no materially adverse impacts to adjacent properties, and no nuisance or serious hazard associated with the use on the proposed tower, that the Planning Board can find that the application is in conformance with Section 3.10 of the Town of Acton Zoning Bylaws.

Please note that the Applicant has not yet included in this application a colored rendering of the proposed Wireless Communication Facility, a topographic map showing areas where the proposed facility shall be located, or photos taken from a balloon float as required by sections 3.7.10 and 3.7.11 of the "Rules and Regulations for a Wireless Communication Facility Special Permit." The Applicant is proposing to coordinate a time with the Planning Board in which to conduct the float and will provide the associated photos and map after this has occurred. Thank you in advance for your time and consideration. If you have any questions, please do not hesitate to contact me directly at the number listed above.

Sincerely,  
Deschenes & Farrell, PC



Kevin S. Eriksen

Enclosures.  
Cc: Client

**ACTON PLANNING BOARD**

**APPLICATION for a WIRELESS COMMUNICATION FACILITY SPECIAL PERMIT \*\***

Refer to the "Rules and Regulations for Wireless Communication Facility Special Permits" available from the Planning Department for details on the information and fees required for this application. Contact the Planning Department at 978-264-9636 with any questions concerning the Rules. Incomplete applications may be denied.

*Please type or print your application.*

1. Location and Street Address of Site 5 Craig Rd  
Area of Site 3.65 ac.
2. Applicant's Name & Address SBA Towers II, LLC 5900 Broken Sound Parkway, Boca Raton, FL  
Telephone 508-799-2460 ext 304 33487
3. Record Owner's Name & Address Palmer Realty - 7 Craig Rd, Acton, MA  
Telephone 978-264-4221
4. Zoning District(s) of Parcel(s) LI Town Atlas Map & Parcel Number(s) H4-13 + H4-45
5. Describe why the proposed Wireless Communication Facility cannot be accommodated on an existing facility (use additional sheets as necessary).

Location of site fills coverage gap for Clearwire and T-Mobile. There  
are no towers in this area.

\*\* and any other permit relief as may be required under the Zoning By-law of Acton to allow the proposed use.

The undersigned hereby apply to the Planning Board for a public hearing and a Wireless Communication Facility Special Permit under Section 3.10 of the Zoning Bylaw.

The undersigned hereby certify that the information on this application and plans submitted herewith is correct, and that the application complies with all applicable provisions of Statutes, Regulations, and Bylaws to the best of his/her knowledge.

The above is subscribed to and executed by the undersigned under the penalties of perjury in accordance with MGL Ch. 268, Section 1-A.

11-30-09

Date

  
Signature of Applicant Leonard Palmeri

RECORD OWNER'S KNOWLEDGE AND CONSENT

I hereby assert that I have knowledge of and give my consent to the application presented above.

11-30-09

Date



Signature of Owner

*Leonard Palma*



Town of Acton  
472 Main Street  
Acton, MA 01720  
Telephone (978) 264-9622  
Fax (978) 264-9630

Brian McMullen  
Assistant Assessor

Locus:  
Parcel:  
5 & 7 CRAIG Rd  
H4-45 & H4-13

Location	Parcel ID	Owner	Co-Owner	Mailing Address	City	ST	Zip
65 MASS AV	G4-173	TOWN OF ACTON		472 MAIN ST	ACTON	MA	01720
70 HOSMER ST	G4-197	COMMONWEALTH OF MASS	WOODS	DEPT OF PUBLIC WORKS	BOSTON	MA	02108
96 MASS AV	G4-198	COMMONWEALTH OF MASS		DEPT OF PUBLIC WORKS	BOSTON	MA	02108
8 RUSSELL RD	G4-205	JUSSAUME CAROLYN	JUSSAUME RICHARD	8 RUSSELL RD	ACTON	MA	01720
316 SCHOOL ST	H4-5	COMMONWEALTH OF MASS	STATE FARM	DEPT OF PUBLIC WORKS	BOSTON	MA	02108
323 SCHOOL ST	H4-6	COMMONWEALTH OF MASS	STATE FARM	DEPT OF PUBLIC WORKS	BOSTON	MA	02108
5 RUSSELL RD	H4-7	WHALEN JUNE M	CASEY JAY W	5 RUSSELL RD	ACTON	MA	01720
7 RUSSELL RD	H4-8	HARDY TERESE	HARDY PAUL	7 RUSSELL RD	ACTON	MA	01720
19 CRAIG RD	H4-9	CRAIG ROAD ASSOCIATES LLC		19 CRAIG RD	ACTON	MA	01720
20 CRAIG RD	H4-10	HAARTZ CORPORATION		87 HAYWARD ROAD	ACTON	MA	01720
17 CRAIG RD	H4-11	BRESLOUF JOHN		17 CRAIG ROAD	ACTON	MA	01720
15 CRAIG RD	H4-12	15 CRAIG RD LLC		SUITE 200	FRAMINGHAM	MA	01701
18 CRAIG RD	H4-14	MURPHY STEVEN P TRUSTEE		1881 WORCESTER RD	W CONCORD	MA	01742
2 CRAIG RD	H4-25	MURPHY STEVEN P TRUSTEE		OBRIEN INVESTMENT PARTNER PO BOX 1250	W CONCORD	MA	01742
3 RUSSELL RD	H4-28	PUTNAM ERVIN		OBRIEN INVESTMENT PARTNER PO BOX 1250	W CONCORD	MA	01720
9 FOSTER ST	H4-41	LACEY BETTE ANN	C/O BETTE LACEY	9 FOSTER STREET	ACTON	MA	01720
3 CRAIG RD	H4-46	CRAIG MERWIN H		9 FOSTER ST	ACTON	MA	01720
300 SCHOOL ST	H4-55	PAQUETTE GEORGE A		60 NEWTON ST	WESTON	MA	02193
274 SCHOOL ST	H4-61	PARKER CHARLOTTE M TRUSTEE		300 SCHOOL ST	ACTON	MA	01720
298 SCHOOL ST	H4-63	BURGIN THOMAS F		274 SCHOOL ST	ACTON	MA	01720
312 SCHOOL ST	H4-66	MURPHY STEVEN P TRUSTEE		128 WEST PLAIN ST	WAYLAND	MA	01778
315 SCHOOL ST	H4-76	ACTON WATER DISTRICT		OBRIEN INVESTMENT PARTNER PO BOX 1250	W CONCORD	MA	01442
307 SCHOOL ST	H4-76-1	DODGE JOHN		472 MAIN STREET	ACTON	MA	01720
303 SCHOOL ST REAR	H4-76-2	SNEY CHRISTOPHER T		307 SCHOOL ST	ACTON	MA	01720
287 SCHOOL ST REAR	H4-76-3	SNYER MARJORIE M		303 SCHOOL STREET	ACTON	MA	01720
308 SCHOOL ST	H4-76-4	COOPER KENNETH A		287 SCHOOL STREET	ACTON	MA	01720
311 SCHOOL ST	H4-76-5	TIPTON FREDERICK J		309 SCHOOL ST	ACTON	MA	01720
292 SCHOOL ST	H4-79	BERGIN THOMAS F		311 SCHOOL ST	ACTON	MA	01720
300 SCHOOL ST	H4-80	PAQUETTE GEORGE A		128 WEST PLAIN ST	WAYLAND	MA	01778
288 SCHOOL ST	H4-86	MAGLOTHIN MICHAEL J		300 SCHOOL ST	ACTON	MA	01720
290 SCHOOL ST	H4-87	HAO TIAN		288 SCHOOL ST	ACTON	MA	01720
				290 SCHOOL ST	ACTON	MA	01720

Brian McMullen  
Assistant Assessor

Locus: 5 & 7 CRAIG Rd  
Parcel: H4-45 & H4-13

Location	Parcel ID	Owner	Co-Owner	Mailing Address	City	ST	Zip
296 SCHOOL ST	H4-88	HARLEY RODERICK	CO HARLEY GARRY D + HARLEY CHERYL	296 SCHOOL ST	ACTON	MA	01720
303 SCHOOL ST	H4-89	SHEA CHRISTOPHER T	SHEA MARYANN V	303 SCHOOL ST	ACTON	MA	01720
305 SCHOOL ST	H4-90	WEIR JUSTIN W	WEIR JULIE A	305 SCHOOL ST	ACTON	MA	01720
282 SCHOOL ST	H4-97	PERINI CRAIG E	PERINI VALERIE L	282 SCHOOL ST	ACTON	MA	01720
299 SCHOOL ST	H4-98	QUINN JAMES F	QUINN KATHLEEN A	299 SCHOOL ST	ACTON	MA	01720
286 SCHOOL ST	H4-100	PENNEY DAN S	PENNEY LAURIE A	286 SCHOOL ST	ACTON	MA	01720
284 SCHOOL ST	H4-100-1	LIN SHU-FANG	LIN FREEMAN CHEN-SHI	284 SCHOOL ST	ACTON	MA	01720
280 SCHOOL ST	H4-102-1	FRENCH THOMAS	FRENCH LYNNE	280 SCHOOL STREET	ACTON	MA	01720
295 SCHOOL ST	H4-103	ROSE SCOTT D	WARD MEREDITH N	295 SCHOOL ST	ACTON	MA	01720
287 SCHOOL ST	H4-106	SNYER MARJORIE M		287 SCHOOL ST	ACTON	MA	01720
291 SCHOOL ST	H4-107	SALZ NORBERT J	CLARK JANET I	291 SCHOOL ST	ACTON	MA	01720
285 SCHOOL ST	H4-110	BURKE WILLIAM M JR	GAZELLE ELIZABETH	285 SCHOOL ST	ACTON	MA	01720
28 LAWSBROOK RD	H4-113	ACTON WATER DISTRICT		PO BOX 953	ACTON	MA	01720

Abutters and owners of land directly opposite on any public or private street or way and abutters to the abutters within one thousand feet of the property line all as they appear on the most recent applicable tax list.

HEARING NOTICES FOR ALL SPECIAL PERMITS MUST BE SENT TO THE  
PLANNING BOARD, TOWN HALL IN THE FOLLOWING TOWNS:

Boxborough, MA 01729 Maynard, MA 01754 Concord, MA 01742 Littleton, MA 01460  
Carlisle, MA 01741 Stow, MA 01775 Westford, MA 01886 Sudbury, MA 01776

5-Nov-09

Kimberly Hoyt  
Assessing Clerk  
Acton Assessors Office



I, Peter Shribman, Trustee of Dan Nikk Realty Trust u/d/t dated December 16, 1986, recorded with Middlesex South District Registry of Deeds at Book 17683, Page 508

of Swampscott, Essex

County, Massachusetts.

being ~~conveyed~~ for consideration paid, and in full consideration of (\$60,000.00)

-----Sixty thousand and No/100 Dollars-----

granted to Leonard N. Palmer and Craig D. Palmer, d/b/a Palmer Realty Company

of Craig Road, Acton, Middlesex County,

with quitclaim covenants

whereafter

[Description and encumbrances, if any]

See description attached.

PROPERTY ADDRESS: Lot 4A, Craig Road, Acton, MA

REG 12/27/92 \$25.00  
\$25.00 MASS. EXCISE TAX \$25.00 TAX



Witness my hand and seal this 27<sup>th</sup> day of December, 1992

Dan Nikk Realty Trust

By: [Signature] trustee  
Peter Shribman, Trustee

The Commonwealth of Massachusetts

SS.

December 2, 1992

Then personally appeared the above named Peter Shribman, Trustee of Dan Nikk Realty Trust as aforesaid and acknowledged the foregoing instrument to be his free act and deed before me

[Signature]  
Notary Public — Justice of the Peace

My commission expires 7-29 1999

(\*Individual — Joint Tenants — Tenants in Common.)

CHAPTER 183 SEC. 6 AS AMENDED BY CHAPTER 497 of 1969

Every deed presented for record shall contain or have endorsed upon it the full name, residence and post office address of the grantor and a recital of the amount of the full consideration therefor in dollars or the name of the other consideration therefor, if not delivered for a specific monetary sum. The full consideration shall mean the total price for the conveyance without deduction for any liens or encumbrances assumed by the grantor or remaining thereon. All such endorsements and recitals shall be recorded as part of the deed. Failure to comply with this section shall not affect the validity of any deed. No register of deeds shall accept a deed for recording unless it is in compliance with the requirements of this section.

A certain parcel of land situated in Acton, Middlesex County, Massachusetts, being shown as Lot 4A on a plan entitled, "Plan of Land in Acton, Mass. (Williamsburg Park)" owned by: Marwin H. Craig, Scale: 1" = 60 feet, September 7, 1965, Everett M. Brooks Co., Civil Engineers, Newtonville, Wayland, W. Acton, Massachusetts, recorded with the Middlesex South District Registry of Deeds in Book 10966, Page End, being bounded and described as follows:

- SOUTHWESTERLY** by Craig Road, as shown on said plan, one hundred twenty-five and 00/100 (125.00) feet;
- NORTHWESTERLY** by Lot 5, as shown on said plan, three hundred eleven and 16/100 (311.16) feet;
- NORTHEASTERLY** by land of The Commonwealth of Massachusetts, as shown on said plan, by two courses measuring respectively, seventy and 00/100 (70.00) feet and seventy-five and 49/100 (75.49) feet; and
- SOUTHEASTERLY** by Lot 3A, as shown on said plan, two hundred eighty-six and 74/100 (286.74) feet.

Said Lot 4A containing 46,814 square feet of land, according to said plan.

Said premises are conveyed subject to and with the benefit of easements, rights, restrictions and agreements of record, if any there be, insofar as the same are now in force and applicable.

For title reference see deed from Marwin H. Craig to the grantor dated December 17, 1966, recorded with said Deeds at Book 17683, Page 514.



Being the same premises conveyed to me by deed of Aubrey E. Jones, Trustee of Mel-Web Realty Trust, dated January 6, 1986 and recorded at Middlesex South Registry of Deeds in Book 16693, Page 589.

Property address: Lot 6A Acton, MA. (Craig Road)

Executed as a sealed instrument this

8<sup>th</sup> day of October 1987

Jacqueline A. Palmer  
JACQUELINE A. PALMER

Leonard N. Palmer  
LEONARD N. PALMER

Craig Palmer  
CRAIG PALMER

The Commonwealth of Massachusetts

Middlesex

October 8, 1987

Then personally appeared the above named JACQUELINE A. PALMER, CRAIG PALMER and  
LEONARD N. PALMER

and acknowledged the foregoing instrument to be their free act and deed,

Before me, Luz L. LaRota  
Notary Public - Justice of the Peace

My commission expires Aug 22 1992

CANCELLED

176.80



Tower Engineering Professionals, Inc.  
3703 Junction Blvd.  
Raleigh, NC 27603  
(919) 661-6351

**Date:** November 25, 2009

**To:** SBA Towers II, LLC.  
5900 Broken Sound Parkway NW  
Boca Raton, FL 33487-2797

**Subject:** Water Balance Calculations

**Site Name:** Acton  
**SBA Site #:** MA11845-S  
**TEP Site #:** 0924585

**Site Location:** 5 Craig Road, Acton, MA 01720  
North 42° 28' 2.71", West 71° 25' 7.82"

**Background**

SBA Towers is proposing a new telecommunications facility for a 170 ft monopole tower located at 5 Craig Road, Acton, MA. Section 3.8 of *RULES AND REGULATIONS for a WIRELESS COMMUNICATIONS FACILITY SPECIAL PERMIT* requires that water balance calculations be submitted for the proposed tower.

**Summary**

Tower Engineering completed "Drainage Calculations" on November 25, 2009 per section 3.9 of *RULES AND REGULATIONS for a WIRELESS COMMUNICATIONS FACILITY SPECIAL PERMIT*. The result of this analysis was that the proposed tower facility will not increase the peak runoff discharge from pre to post-development. Since there is no net increase in runoff from the proposed tower facility there will be no change in storage for the watershed. Water balance calculations would result in pre-development and post-development conditions being equal. Please inform us if further analysis is needed.

We at Tower Engineering Professionals, Inc. appreciate the opportunity of providing our continuing professional services to you and SBA Towers. If you have any questions or need further assistance on this or any other projects please give us a call.

Sincerely,

  
J. Russell, P.E.  
Senior Engineer  
Tower Engineering Professionals, Inc.





Tower Engineering Professionals, Inc.  
3703 Junction Blvd.  
Raleigh, NC 27603  
(919) 661-6351

**Date:** November 25, 2009

**To:** SBA Towers II, LLC.  
5900 Broken Sound Parkway NW  
Boca Raton, FL 33487-2797

**Subject:** Earth Removal Calculations

**Site Name:** Acton  
**SBA Site #:** MA11845-S  
**TEP Site #:** 0924585

**Site Location:** 5 Craig Road, Acton, MA 01720  
North 42° 28' 2.71", West 71° 25' 7.82"

#### Background

SBA Towers is proposing a new telecommunications facility for a 170 ft monopole tower located at 5 Craig Road, Acton, MA. Section 3.10 of *RULES AND REGULATIONS for a WIRELESS COMMUNICATIONS FACILITY SPECIAL PERMIT* requires that earth removal calculations be submitted for the proposed tower.

#### Summary

The proposed location of the tower facility is currently a gravel covered lot. Additional material brought to the site will consist of concrete for equipment foundations and mulch for landscaping. The earth displaced by these foundations will be removed from the site.

##### Cut:

###### Earth:

(100 cubic yards for tower foundation) + (14 cubic yards for equipment foundation for each carrier) x (5 carriers) = 170 ± cubic yards

##### Fill (Including surface cover):

###### Concrete:

(100 cubic yards for tower foundation) + (16 cubic yards per carrier) x (5 carriers) = 180 ± cubic yards

###### Landscaping mulch:

(1500 sq.ft) x (2 inches of cover) = 9.5 ± cubic yards

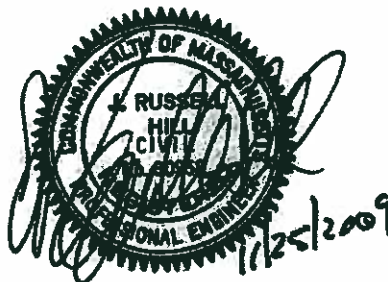
We at Tower Engineering Professionals, Inc. appreciate the opportunity of providing our continuing professional services to you and SBA Towers. If you have any questions or need further assistance on this or any other projects please give us a call.

Sincerely,

J. Russell Hill, P.E.

Senior Engineer

Tower Engineering Professionals, Inc.





Tower Engineering Professionals, Inc.  
3703 Junction Blvd.  
Raleigh, NC 27603  
(919) 661-6351

**Date:** November 25, 2009

**To:** SBA Towers II, LLC.  
5900 Broken Sound Parkway NW  
Boca Raton, FL 33487-2797

**Subject:** Drainage Calculations

**Site Name:** Acton  
**SBA Site #:** MA11845-S  
**TEP Site #:** 0924585

**Site Location:** 5 Craig Road, Acton, MA 01720  
North 42° 28' 2.71", West 71° 25' 7.82"

#### Background

SBA Towers is proposing a new telecommunications facility for a 170 ft monopole tower located at 5 Craig Road, Acton, MA. Section 3.9 of *RULES AND REGULATIONS for a WIRELESS COMMUNICATIONS FACILITY SPECIAL PERMIT (RRSP)* requires that drainage calculations be submitted for the proposed tower.

#### Results

The requirement that the post-development peak stormwater runoff does not exceed the pre-development peak runoff can be met if at least 1,000 sq.ft of new landscaping is used at the proposed site.

#### Calculations

The town of Acton's *RRSP* document and the *Massachusetts Stormwater Handbook Standard 2* require that the post-development peak discharge rate is equal to or less than the pre-development rate from the 2-year and the 10-year 24-hour storms. Measurement of peak discharge rates is calculated at a design point, typically the lowest point of discharge at the down-gradient property boundary.

The rational method was used to determine the pre and post development peak discharge rates.

$$Q_{post} \leq Q_{pre}$$

Where;

$$Q_{post} = C_{post} I_{post} A_{post}$$

$$Q_{pre} = C_{pre} I_{pre} A_{pre}$$

$Q$  = peak runoff rate [cfs]

$C$  = runoff coefficient

$I$  = average rainfall intensity [in/hr]

The equation above can be rewritten as;

$$C_{pre} I_{pre} A_{pre} \leq C_{post} I_{post} A_{post}$$

Where;

$$I_{pre} = I_{post}$$

$$A_{pre} = A_{post}$$

$$\text{Therefore; } C_{pre} \leq C_{post}$$

The proposed location of the tower facility is currently a gravel lot. The new tower facility will contain gravel and concrete areas as well as a mulched landscaped buffer. The increased peak runoff rate 'Q' due to the increased runoff coefficient 'C' from the addition of concrete equipment areas will be offset by the decrease in 'C' from the addition of mulch landscaping buffer. That is, the additional runoff from the concrete will be canceled by the decrease in runoff from the mulch.

Table 1 calculates the weighted 'C' value for pre and post development conditions. For this calculation, the area of required landscaping was determined so that pre and post weighted 'C' values are equal. This results in a minimum of 1,000 sq.ft of new landscaping required to have post-development runoffs less than pre-development runoffs.

**Table 1**

Land use	C	Area <sub>pre</sub>	Area <sub>post</sub>	Weighted C <sub>pre</sub>	Weighted C <sub>post</sub>
Gravel	0.80	33805	31305	0.68	0.630
Concrete	0.95	0	1500	0	0.036
Landscaping	0.50	0	1000	0	0.013
Other	0.60	5966	5966	0.09	0.090
Total:		39770	39770	0.77	0.768

The following values of 'C' were chosen:

0.80 – gravel area

0.95 – concrete area

0.50 – landscaped area

0.60 – other

See Appendix B for reference document.

The current condition of the parcel is assumed to be 85% gravel and 15% other, where "other" consists of a portion of a paved entrance, a row of trees, and compacted soil. This assumption is based on site survey. A conservative area of proposed concrete was used at 1500 sq.ft. The expected area is approximately 1000 sq.ft.

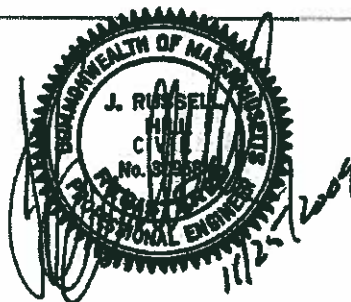
We at *Tower Engineering Professionals, Inc.* appreciate the opportunity of providing our continuing professional services to you and SBA Towers. If you have any questions or need further assistance on this or any other projects please give us a call.

Sincerely,

J. Russell Hill, P.E.

Senior Engineer

Tower Engineering Professionals, Inc.





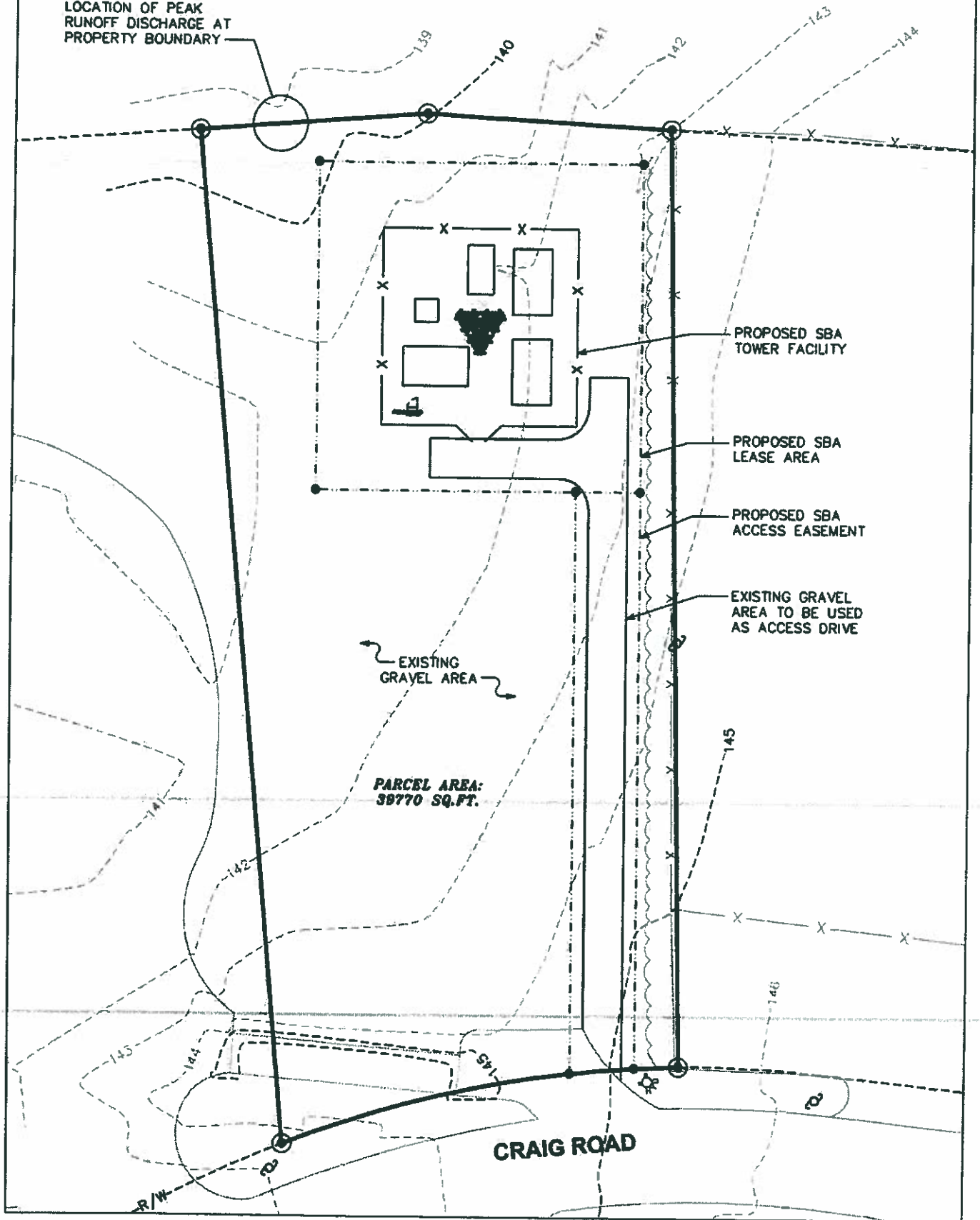
**Appendix A**  
**Site Sketch**



# SITE SKETCH

SCALE: 1" = 40'

LOCATION OF PEAK  
RUNOFF DISCHARGE AT  
PROPERTY BOUNDARY



**Appendix B  
Runoff Coefficients**

**TABLE 6.6 TYPICAL RUNOFF COEFFICIENTS FOR 2-YR  
TO 10-YR FREQUENCY DESIGN**

DESCRIPTION OF AREA	RUNOFF COEFFICIENTS
<b>Business</b>	
Downtown areas	0.70–0.95
Neighborhood areas	0.50–0.70
<b>Residential</b>	
Single-family areas	0.30–0.50
Multi-units, detached	0.40–0.60
Multi-units, attached	0.60–0.75
Residential (suburban)	0.25–0.40
Apartment dwelling areas	0.50–0.70
<b>Industrial</b>	
Light areas	0.50–0.80
Heavy areas	0.60–0.90
Parks, cemeteries	0.10–0.25
Playgrounds	0.20–0.35
Railroad yard areas	0.20–0.40
Unimproved areas	0.10–0.30
<b>Streets</b>	
Asphalt	0.70–0.95
Concrete	0.80–0.95
Brick	0.70–0.85
Drives and walks	0.75–0.85
Roofs	0.75–0.95
<b>Lawns, Sandy Soil</b>	
Flat, 2%	0.05–0.10
Average, 2–7%	0.10–0.15
Steep, 7%	0.15–0.20
<b>Lawns, Heavy Soil</b>	
Flat, 2%	0.13–0.17
Average, 2–7%	0.18–0.22
Steep, 7%	0.25–0.35

These runoff coefficients are typical values for return periods of 2–10 yrs. Higher values are appropriate for higher return periods.

Source: ASCE and WPCF (1969)

## **AFFIDAVIT OF SITE ACQUISITION SPECIALIST**

The undersigned hereby states the following in support of the application by SBA Networks (hereinafter "SBA") to construct and operate a wireless communications facility at 5 Craig Rd, Acton, MA (the "Site").

1. My name is John-Markus Pinard and I am a Site Acquisition Specialist for Centerline Communications. I have been retained by Clear Wireless LLC ("Clearwire") to provide services for the purpose of obtaining approvals, leases, and licenses as well as performing other site acquisition and development tasks involved in building and installing wireless communication facilities. I have performed, and am performing, such services in connection with Clearwire's proposed wireless communications facility located at the Site.
2. I have participated directly or through my present and past employment in the development of such facilities, including wireless communication facilities similar to the facility proposed for the Site. I have personally visited the Site and the area surrounding the Site on numerous occasions. I submit this affidavit based on my personal knowledge of the Site and the surrounding area and based on my professional experience in the development of wireless communication facilities.
3. When Clearwire's radio frequency experts identify an area within which a wireless communications installation is required to provide coverage to a significant gap in its coverage network, the area is illustrated upon a map and issued to the Site Acquisition Specialist. In this instance, the illustrated area is located in the residential areas of Acton and has an approximately .5 mile radius, contingent on terrain and tree coverage in a given location.
4. Part of my site acquisition and development duties include identifying potential candidates within the area identified by Clearwire's radio frequency experts. The candidate identification process includes reviewing the applicable zoning ordinance to identify areas within which the proposed use is allowed. Viable candidates consist of existing structures of sufficient height from which an antenna installation can provide sufficient coverage, or lacking such a structure, parcels located within the narrowly defined search area upon which a tower may be constructed to a sufficient height. In order to be viable, a candidate must provide adequate coverage to the significant gap in Clearwire's network. In addition, all viable candidates must have a willing landowner with whom commercially reasonable lease terms may be negotiated. Preference is given to locations that closely comply with local zoning ordinances, or in the event no viable candidates are determined to be located within such areas, to identify other potentially suitable locations, with preference given to existing structures.
5. In connection with this site, Centerline Communications has provided site acquisition services, including researching the area and identifying potential alternative candidates.
6. In searching the area defined by the radio frequency expert, I found that the area was largely residential and every other candidate was a new build in a zone not suitable for a tower location. The coverage objective for this part of Acton does

not include any existing towers. Clear Wireless is proposing to construct a tower in the Limited Industrial District where towers are allowed pursuant to a Special Permit.

7. Based on my review of the zoning ordinance, my personal knowledge of the area, and the candidates approved by Clearwire's radio frequency expert, none of the potential alternative candidates located within allowed zoning districts are reasonably feasible alternatives to the proposed Site. In addition, based on my experience, in my professional opinion, the Site is the least intrusive and available alternative to provide adequate coverage to this significant gap in Clearwire's network coverage.

Executed this 18th day of November 2009.



---

John-Markus Pinard, Site Acquisition Specialist



4400 Carillon Point  
Kirkland, WA 98033

p: 425-216-7600  
f: 425-216-7900  
www.clear.com

#### **RF ENGINEERING AFFIDAVIT**

Licensee: Clearwire US LLC

Clearwire Site ID: MA-BOS7244

Site Address: 5 Craig Rd, Acton MA 01720

The undersigned hereby state the following in support of the application by Clearwire US LLC, hereafter referred to as Clearwire, to install equipment at approximately 160 feet above ground level (AGL) at the property located at 5 Craig Rd, Acton MA 01720 (hereinafter the "Site MA-BOS7244").

1. I am a Radio Frequency Engineer representing Clearwire, with an office located at 200 5<sup>th</sup> Ave Waltham MA.
2. My primary responsibilities include radio frequency design and planning in the State of Massachusetts, including such areas as the town of Acton and surrounding communities.
3. I have thoroughly reviewed the radio frequency engineering studies, reports and computer models prepared by Clearwire, with respect to the Site.
4. Clearwire is licensed by the Federal Communications Commission (herein after "FCC") to provide wireless broadband communication services by building a network of communication sites using World Interoperability for Microwave Access (WiMAX) technology. This technology, also referred to as IEEE 802.16, utilizes digital transmission to improve the quality and number of available services including, without limitation, Data Services such as Internet and email access, voice over IP and other data applications.
5. In order to build out its network and meet customer demand for Wireless Broadband Services, Clearwire must have in place a system of 'wireless access points' (herein after "WAP") to serve portable wireless communication data devices. A typical WAP, such as the one proposed, consists of three panel antennas and backhaul dishes mounted to a building, tower, church or other structure. The antennas are connected to radio operating equipment housed at or near the structure.
6. To maintain effective, reliable and uninterrupted service, there must be a continuous series of WAPs located within close proximity to each other so as to overlap in a system comparable to a honeycomb pattern. If there is no WAP available to accept/receive the signal, network service to the mobile data service will terminate involuntarily. Accordingly, the overlap of coverage is necessary for the signal to transfer from one WAP to another WAP seamlessly and without involuntary termination.
7. A number of factors determine the distance between cell WAPs, including, but not limited to, topography, physical obstructions, foliage, antenna height and line-of-sight.
8. Based on the radio frequency studies, reports and computer models prepared in connection with this project, it is my professional assertion that there would be inadequate network service for Clearwire customers due to a coverage gap within the town of Acton in the area encompassing Massachusetts Avenue (State Hwy 111), surrounding residential area, surrounding commercial area and nearby roads.



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Kirkland, WA 98033

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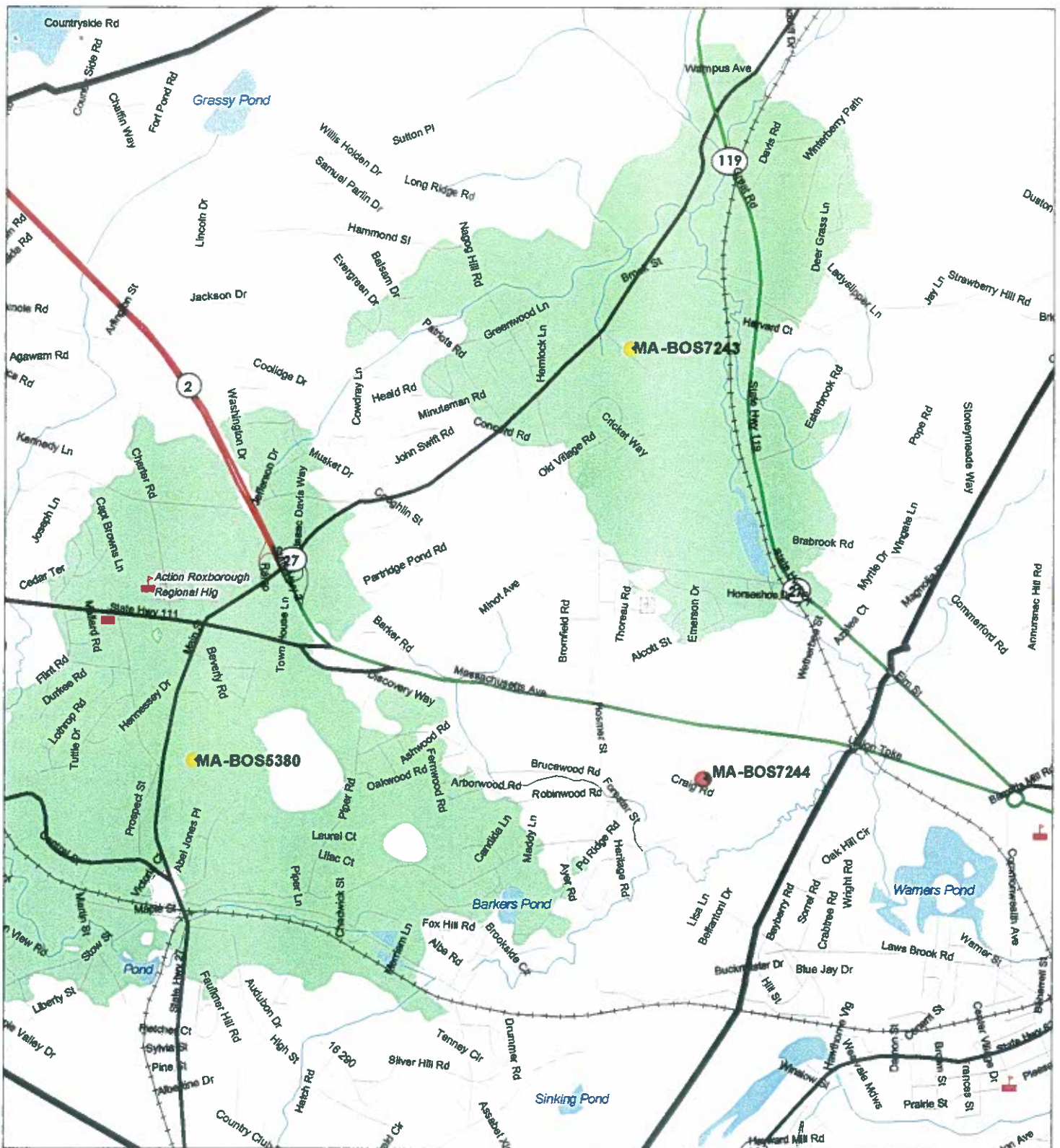
9. Based on the radio frequency studies, reports and computer models prepared in connection with this project, it is my further professional opinion that Clearwire would be able to alleviate this significant gap in coverage by locating Clearwire antennas at an approximate height of (160') feet AGL on the above referenced property as proposed.
10. The proposed wireless broadband communications equipment shall be in compliance with the FCC Guidelines for Evaluating the Environmental Effects of Radio Frequency Radiation. It is the responsibility of Clearwire to make RF field measurements once this WAP will be in service in compliance with FCC guidelines.
11. The proposed wireless communications equipment will be installed, erected, maintained and used in compliance with all applicable Federal, State and local regulations, including, but not limited to: the radio frequency emissions regulations set forth in the 1996 Federal Communications Act, applicable regulations administered by the Federal Aviation Administration (FAA), Federal Communications Commission (FCC), Massachusetts Aeronautics Commission and the Massachusetts Department of Public Health.
12. The RF emission from these proposed WAP antennas would not exceed the State and Federal standards, when combined with all other proposed PWS facilities at 5 Craig Rd, and also that new antenna would not "interfere" with the other existing PWS structures from other carriers at the site location.
13. Based upon the best radio frequency technology available at this time, it is my professional opinion that the proposed WAP is at the minimum height that is needed to ensure adequate service to area residents and businesses within the geographic area described above.

Executed this 28<sup>th</sup> day of October 2009.

A handwritten signature in black ink, appearing to read "Anoop Jaikumar", written over a horizontal line.

Anoop Jaikumar  
RF ENGINEER, Clearwire US LLC





CLEAR

# **Clearwire Wireless Broadband** **Town of Acton** **Reliable Coverage**

Site ID: MA-BOS7244

Address  
 5 Craig Rd  
 Acton, MA 01720

Future Coverage without MA-BOS7244

Proposed Site

Future Sites

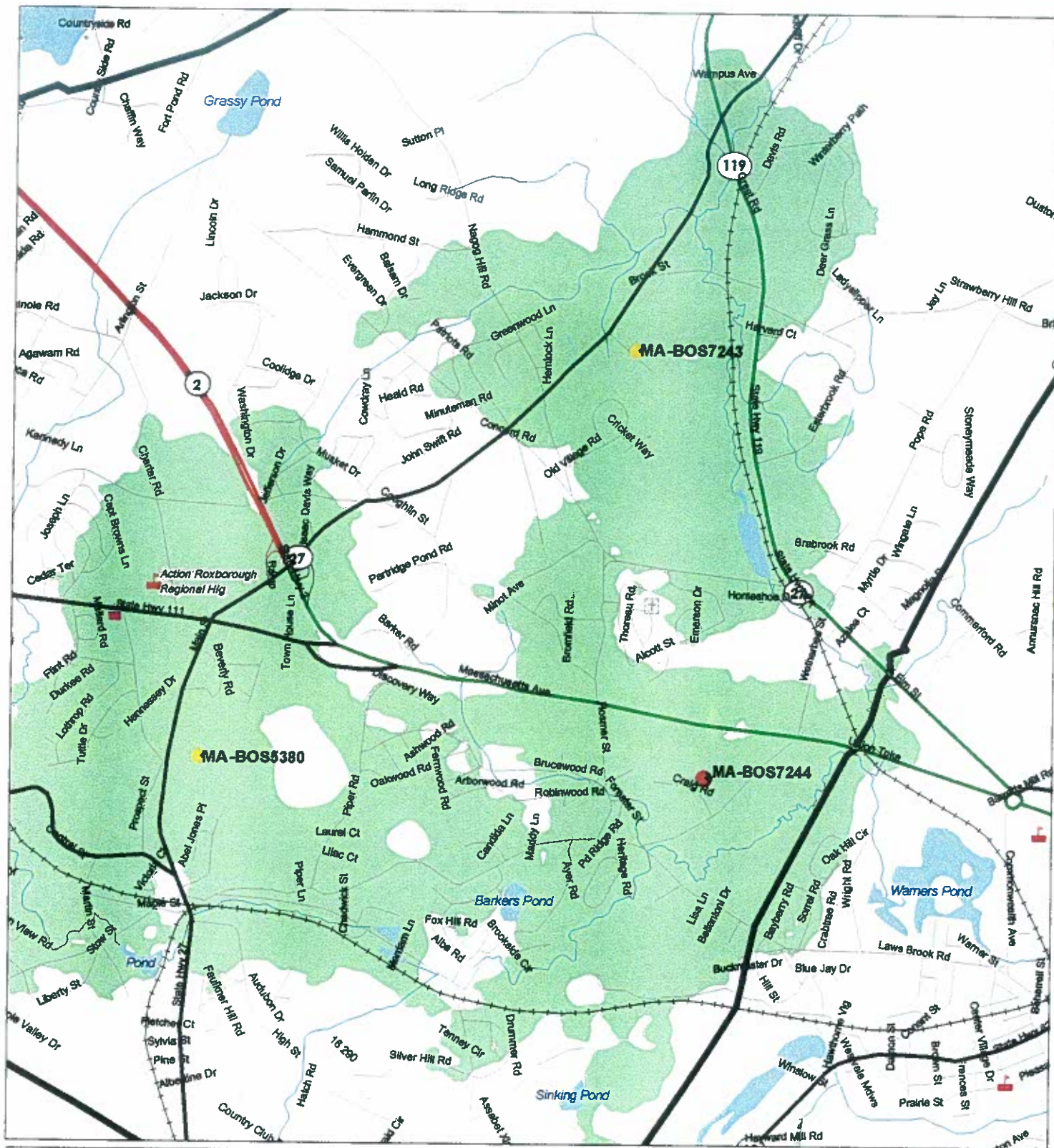
Town Boundary


Water

Scale: 1 Inch = 0.5 mile









**Clearwire Wireless Broadband**  
**Town of Acton**  
**Reliable Coverage**

Site ID: MA-BOS7244

Address  
 5 Craig Rd  
 Acton, MA 01720

Future Coverage with MA-BOS7244

Proposed Site

Future Sites

Town Boundary

Water

Scale: 1 Inch = 0.5 mile

**AFFIDAVIT**  
**of**  
**RADIO FREQUENCY EXPERT**

The undersigned, hereby states the following in support of the application of T-Mobile Northeast, Inc. to construct an antenna installation with related equipment cabinets at 5 Craig Road, Acton, Massachusetts (The "Wireless Communications Facility"):

1. I am a Radio Frequency Engineer representing T-Mobile USA, Inc. and responsible for radio network design in Massachusetts.
2. As enabled under its Federal Communications Commission (FCC) license T-Mobile seeks to design its wireless network in order to provide reliable wireless services to its customers, whether those customers are on the street, in a vehicle, or in a building. Providing reliable service to its customers in each context is critical for T-Mobile to provide the quality of wireless service that customers demand, and to meet the objectives of Congress that a robust, competitive and low cost wireless communication capacity be developed to serve the entire nation.
3. I have thoroughly reviewed the radio frequency engineering studies, reports, and computer model prepared by T-Mobile with respect to the subject wireless communications facility. I used Asset, a propagation modeling software developed by Aircom Inc., to simulate the proposed coverage created by the facility. This software calculates frequency strength over distance taking into account geographical, and topographical land features and other contributors to signal loss. Finally, this calculation has also been adjusted by empiric data obtained from field measurement.
4. In order to meet its obligations under the radio license T-Mobile must have in place a network of base station antenna facilities to serve portable wireless communication devices and mobile telephones. These facilities consist of antennas mounted on a pole, building, or other structures that are connected by cables to a small equipment cabinet located near the antenna. These antennas transmit voice and data to subscribers within a defined area of coverage. Likewise, the antenna receives the radio signal from mobile transmitters (such as telephones) which then goes to equipment located in the cabinet and to ordinary phone lines from which the transmission may be routed anywhere in the world.
5. Wireless antenna facilities are integral to T-Mobile's network. Each facility, servicing only a limited area, must be carefully located so that it can properly interact with surrounding facilities. To maintain reliable, uninterrupted service to a wireless telephone user living and/or traveling in a given area serviced by multiple antenna



facilities, T-Mobile depends on a continuous interconnected series of facilities, which in-part overlap in a grid or "cellular" pattern.

6. In compliance with its FCC license, T-Mobile is actively building its PCS network to provide service in Massachusetts. In order to meet its goal of providing reliable, seamless and uninterrupted service T-Mobile must continue to acquire interest in property for additional facilities, and is applying for and obtaining local governmental approvals to construct the facilities in order to eliminate gaps in reliable service coverage. Any delay at this point in time severely curtails T-Mobile's ability to achieve a market position that will allow it to compete for customers, which is in the public interest.
7. Using precise computer prediction model and following a thorough review of the RF engineering studies and reports prepared by T-Mobile it was determined that a new facility at 5 Craig Road, Acton, Massachusetts is critical to the overall engineering and technical plan for T-Mobile's network. Modifications to existing on-air sites will not fill the coverage gap.
8. The subject location has specific characteristics, of topography, relationship to existing structures and its location within the narrow search limits specified by the above referenced computer model, makes it uniquely suitable to address T-Mobile's need for a proposed wireless telecommunications transmission facility. With the above considerations the proposed site was determined to be the most appropriate location for a facility to fill the existing gap in service coverage within the context of available land parcels provided to me for analysis.
9. Without a wireless transmission facility located at or near this location, a significant area of inadequate, unreliable coverage would remain in T-Mobile's wireless network in the vicinity of the proposed installation. This lack of service area or "gap" in coverage would adversely impact the service T-Mobile is able to provide in-building coverage to businesses and residents north and south of Rt. 2 between Hosmer Street and Commonwealth Avenue well as travelers along Rt. 2 and Rt. 2A in Acton, Massachusetts.
10. The result of such a "gap" will be an inability for the T-Mobile customer to reliably initiate, receive, or maintain voice and data connections, including 911 emergency calls, from the time that subscriber leaves the service area until that subscriber reaches that point where a quality signal is available to reinitiate the communication link.
11. All proposed wireless communications equipment will be installed, erected, maintained and operated in compliance with all applicable Federal, State and local regulations, including, but not limited to: the radio frequency emissions regulations

set forth in the 1996 Federal Communications Act, applicable regulations administered by the Federal Aviation Administration (FAA), Federal Communications Commission (FCC), Massachusetts Aeronautics Commission and the Massachusetts Department of Health. All equipment proposed is authorized by the FCC Guidelines for Evaluating the Environmental effects of Radio Frequency Emissions. The radio frequency exposure levels generated by the proposed facility are substantially below the maximum allowable health and safety standards established by the FCC. In addition, the proposed equipment and transmission characteristics are in compliance with standards set forth by the American National Standards Institute (ANSI) and the National Council of Radiation Protection (NCRP).

Based upon the best radio frequency technology that is available to T-Mobile at this time, it is my professional opinion that the proposed project is necessary to ensure adequate PCS service to area residents and businesses in accordance with system specifications.

Signed under the penalties of perjury this 28 day of October, 2009.



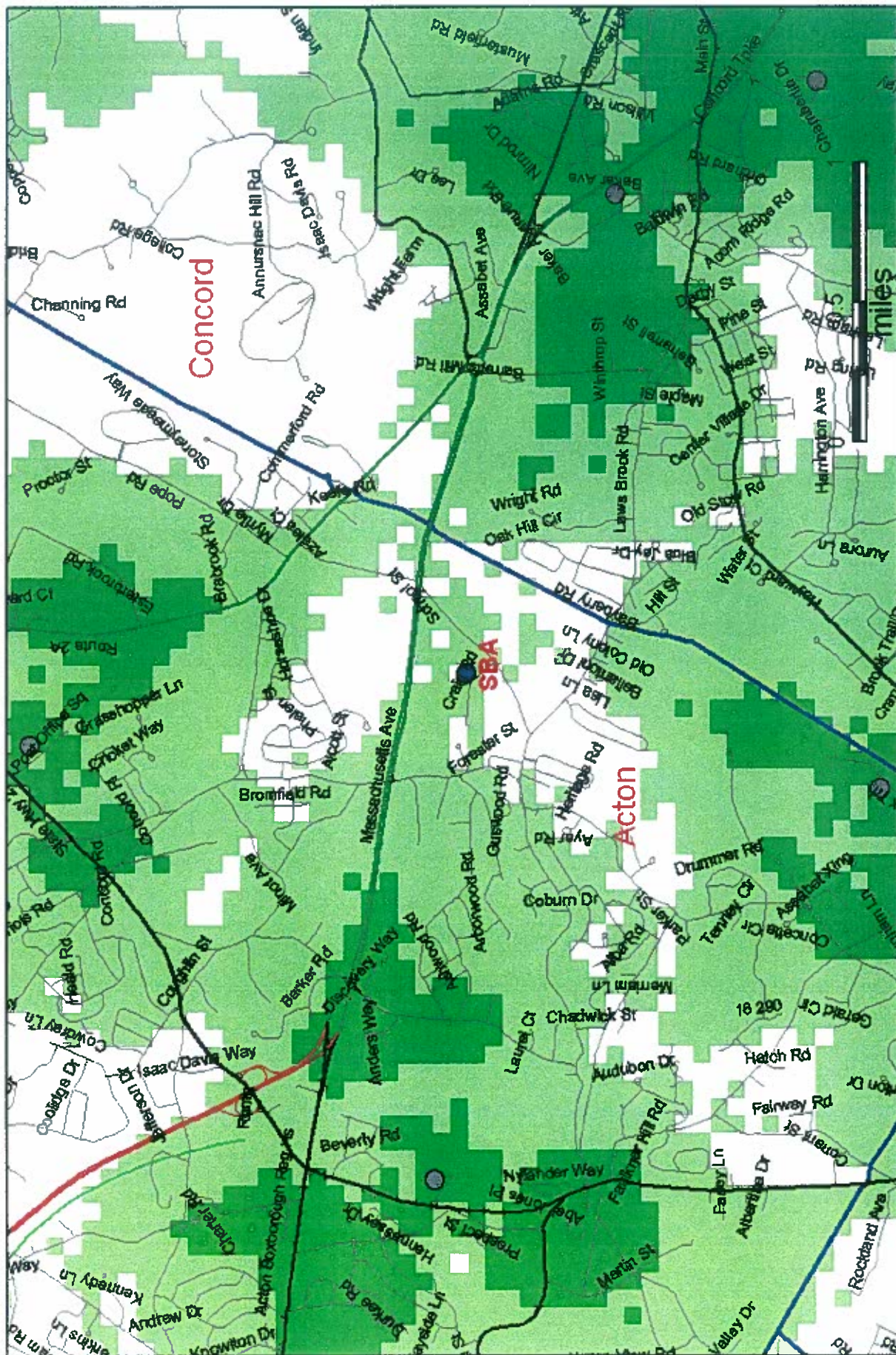
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**Don Nguyen, RF Engineer**  
**T-Mobile USA, INC.**  
15 Commerce Way Suite B  
Norton, MA 02766  
(508) 286-2789  
Don.nguyen30@T-Mobile.com



# T-Mobile- Existing Coverage

In-Building Coverage = Green  
In-Vehicle Coverage = Light Green

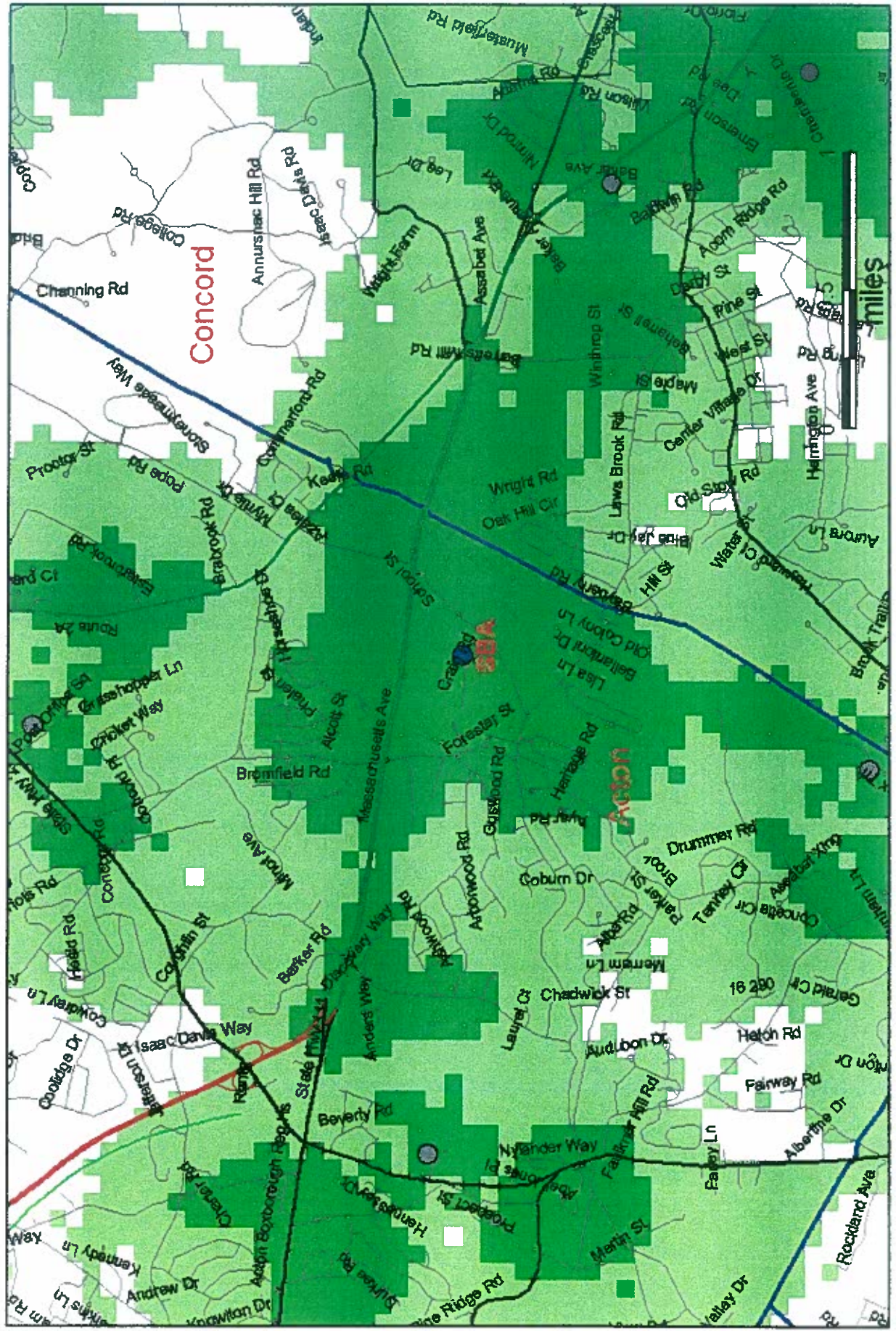




# T-Mobile- Existing & Proposed SBA Coverage

In-Building Coverage = Green

In-Vehicle Coverage = Light Green







[FCC Home](#) | [Search](#) | [Updates](#) | [E-Filing](#) | [Initiatives](#) | [For Consumers](#) | [Find People](#)

## Universal Licensing System

[FCC](#) > [WTB](#) > [ULS](#) > [Online Systems](#) > [License Search](#)

[FCC Site Map](#)

ULS License

### Broadband Radio Service License - B051 - NSAC, LLC

[HELP](#)

[New Search](#) [Printable Page](#) [Reference Copy](#) [Map License](#)

**MAIN** **ADMIN** **LOCATIONS** **CONTACT**

<b>Call Sign</b>	B051	<b>Radio Service</b>	BR - Broadband Radio Service
<b>Status</b>	Active	<b>Auth Type</b>	Regular
<b>Dates</b>			
<b>Grant</b>	04/10/2006	<b>Expiration</b>	03/28/2016
<b>Effective</b>	06/11/2009	<b>Cancellation</b>	
<b>Buildout Deadlines</b>			
<b>1st</b>		<b>2nd</b>	
<b>Notification Dates</b>			
<b>1st</b>		<b>2nd</b>	

#### Licensee

<b>FRN</b>	0003768553 ( <a href="#">View Ownership Filing</a> )	<b>Type</b>	Limited Liability Company
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#### Licensee

NSAC, LLC 815 Connecticut Avenue, NW, Suite 610 Washington, DC 20006 ATTN Nadja Sodos-Wallace	P:(202)330-4011 F:(202)330-4008 E:nadja.sodoswallace@clearwire.com
--	--

#### Contact

Clearwire Corporation 815 Connecticut Avenue, NW, Suite 610 Washington, DC 20006 ATTN Nadja Sodos-Wallace	P:(202)330-4011 F:(202)330-4008 E:nadja.sodoswallace@clearwire.com
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#### Broadband Radio Service and Educational Broadband Service Information

Will the requested facilities be used to provide multichannel video No programming service?

If the answer to the above question is yes, does applicant operate, control or have an attributable interest (as defined in Section 27.1202 of the Commission's Rules) in a cable television system whose franchise area is located within the geographic service area of the requested facilities?

Does the applicant comply with the programming requirements contained in Section 27.1203 of the Commission's Rules?

**Geographic Service Area**

Authorization Type BTA  
Market BTA051  
Boston, MA

**Channel Plan/Channel Number Information**

Channel Plan	Channel Number
New	BRS1 002496.00000-002502.00000 MHz
New	BRS2 002618.00000-002624.00000 MHz
New	E1 002624.00000-002629.50000 MHz
New	E2 002629.50000-002635.00000 MHz
New	E3 002635.00000-002640.50000 MHz
New	E4 002608.00000-002614.00000 MHz
New	F1 002640.50000-002646.00000 MHz
New	F2 002646.00000-002651.50000 MHz
New	F3 002651.50000-002657.00000 MHz
New	F4 002602.00000-002608.00000 MHz
New	H1 002657.00000-002662.50000 MHz
New	H2 002662.50000-002668.00000 MHz
New	H3 002668.00000-002673.50000 MHz

**Ownership and Qualifications**

Radio Service Type Fixed, Mobile  
Regulatory Status Non-Common Carrier Interconnected Yes

**Alien Ownership**

The Applicant answered "No" to each of the Alien Ownership questions.

**Basic Qualifications**

The Applicant answered "No" to each of the Basic Qualification questions.

**Tribal Land Bidding Credits**

This license did not have tribal land bidding credits.

**Demographics**

Race  
Ethnicity Gender

**ULS Help** ULS Glossary - FAQ - Online Help - Technical Support - Licensing Support  
**ULS Online Systems** CORES - ULS Online Filing - License Search - Application Search - Archive License Search  
**About ULS** Privacy Statement - About ULS - ULS Home  
**Basic Search** By Call Sign =

FCC | Wireless | ULS | CORES

Help | Tech Support

Federal Communications Commission  
445 12th Street SW  
Washington, DC 20554

Phone: 1-877-480-3201  
TTY: 1-717-338-2824  
[Submit Help Request](#)

FCC WTB Radio Station Authorization

Federal Communications Commission  
Wireless Telecommunications Bureau

Radio Station Authorization (Reference Copy Only)

This is not an official FCC license. It is a record of public information contained in the FCC's licensing database on the date that this reference copy was generated. In cases where FCC rules require the presentation, posting, or display of an FCC license, this document may not be used in place of an official FCC license.

Licensee: T-Mobile License LLC

ATTN Dan Menser  
T-Mobile License LLC  
12920 SE 38th St  
Bellevue, WA 98006

FCC Registration Number (FRN): 0001565449	
Call Sign: KNLF954	File Number: 0002991471
Radio Service: CW - PCS Broadband	

Grant Date 06/05/2007	Effective Date 06/05/2007	Expiration Date 06/27/2017	Print Date 09/06/2007
Market Number: BTA051		Channel Block: D	Sub-Market Designator: 0
Market Name: Boston, MA			
1st Build-out Date 06/27/2002	2nd Build-out Date	3rd Build-out Date	4th Build-out Date

**Special Conditions or Waivers/Conditions** This authorization is subject to the condition that the remaining balance of the winning bid amount will be paid in accordance with Part 1 of the Commission's rules, 47 C.F.R. Part 1.

This authorization is subject to the condition that, in the event that systems using the same frequencies as granted herein are authorized in an adjacent foreign territory (Canada/United States), future coordination of any base station transmitters within 72 km (45 miles) of the United States/Canada border shall be required to eliminate any harmful interference to operations in the adjacent foreign territory and to ensure continuance of equal access to the frequencies by both countries.

**Conditions**

Pursuant to Section 309(h) of the Communications Act of 1934, as amended, 47 U.S.C. Section 309(h), this license is subject to the following conditions: This license shall not vest in the licensee any right to operate the station nor any right in the use of the frequencies designated in the license beyond the term thereof nor in any other manner than authorized herein. Neither the license nor the right granted thereunder shall be assigned or otherwise transferred in violation of the Communications Act of 1934, as amended. See 47 U.S.C. Section 310(d). This license is subject in terms to the right of use or control conferred by Section 706 of the Communications Act of 1934, as amended. See 47 U.S.C. Section 606.

To view the geographic areas associated with the license, go to the Universal Licensing System (ULS) homepage at <http://wireless.fcc.gov/uls/> and select "License Search". Follow the instruction on how to search for license information

FCC 601 - MB

## TOWAIR Determination Results

A routine check of the coordinates, heights, and structure type you provided indicates that this structure does not require registration.

### \*\*\* NOTICE \*\*\*

TOWAIR's findings are not definitive or binding, and we cannot guarantee that the data in TOWAIR are fully current and accurate. In some instances, TOWAIR may yield results that differ from application of the criteria set out in 47 C.F.R. Section 17.7 and 14 C.F.R. Section 77.13. A positive finding by TOWAIR recommending notification should be given considerable weight. On the other hand, a finding by TOWAIR recommending either for or against notification is not conclusive. It is the responsibility of each ASR participant to exercise due diligence to determine if it must coordinate its structure with the FAA. TOWAIR is only one tool designed to assist ASR participants in exercising this due diligence, and further investigation may be necessary to determine if FAA coordination is appropriate.

#### DETERMINATION Results

**PASS SLOPE(50:1): NO FAA REQ-RWY 10499 MTRS OR LESS & 7892.79 MTRS (7.89280 ) KM AWAY**

Type	C/R	Latitude	Longitude	Name	Address	Lowest Elevation (m)	Runway Length (m)
AIRP	R	42-27-30.00N	071-30-50.00W	MINUTE MAN AIR FIELD	MIDDLESEX STOW, MA	81.4	844.2999999999995

#### Your Specifications

##### NAD83 Coordinates

Latitude	42-28-03.2 north
Longitude	071-25-07.4 west

##### Measurements (Meters)

Overall Structure Height (AGL)	60.7
Support Structure Height (AGL)	57.9
Site Elevation (AMSL)	43.3

##### Structure Type

TOWER - Free standing or Guyed Structure used for Communications Purposes